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DENTISTRY FOR CHILDREN



"HUMAN PROGRESS MARCHES
ONLY WHEN CHILDREN EXCEL THEIR PARENTS"



GEORGIA DEPARTMENT OF PUBLIC HEALTH
ATLANTA, GEORGIA

DENTISTRY FOR CHILDREN

"One of the important factors in general health is dental health. No public health program is complete without an effective dental health program. In all phases of preventive medicine and dentistry we must begin with the child. The dentists of Georgia are to be commended for their increasing interest in child health."

T. F. Abercrombie, M. D., Director
State Department of Public Health

This bulletin is offered as supplementary material to the Refresher Course in Children's Dentistry given to the dentists of Georgia by the Georgia State Department of Public Health, April, 1939, Dr. Walter C. McBride, clinician.

We wish to acknowledge help received from various pamphlets and articles published by the Bureau of Public Relations of the American Dental Association, Bulletin on Children's Dentistry by the Nebraska State Department of Public Health, Outline of Instruction, Postgraduate Course in Children's Dentistry, published by the Minnesota Department of Public Health. The technical procedures in this bulletin were prepared by Doctors Frank Lamons and H. H. Burkart, Atlanta.

April, 1939

INTRODUCTION

Existing Dental Conditions Present Health Problem

Evidences of the need for dental health and dental health education for children are indicated in reports of surveys made by the United States Public Health Service. Quoting bulletin No. 622, United States Public Health Service:

"For a number of years the United States Public Health Service has been engaged in studies and investigations of the physical status of school children, and as a result of these investigations it has repeatedly drawn attention to the overwhelming preponderance of dental defects over those of all other classes.

"The bad effect of decaying teeth, of inflamed gums, and of suppurating areas in the oral cavity on the health and development of young children is obvious, and no effort should be spared to prevent the occurrence of such conditions.

"The provision of dental facilities, both preventive and operative, for school children, is a measure which promises to yield the most fruitful results in conserving their health.

"This article has been prepared as a result of the long-felt need of this form of health supervision, and in response to the numerous requests received for information pertaining to the establishment of school dental clinics.

"The great need for dental health education can best be illustrated by statistics showing the incidence of dental defects in various groups. It is generally agreed that almost 100% of the adult population are affected by dental defects. Examination of the mouths of school children show an appalling percentage of defects. According to a survey made by the United States Public Health Service in conjunction with the American Dental Association, in 1933 and 1934, the examination of school children, aged 6 to 14 years, revealed dental defects in over 90% of cases. In children aged 9 to 11, over 55% had dental decay in permanent teeth. In the same age groups, only 37% had had dental treatment prior to examination.

"These statistics show that, of all defects observed in school children, the class of dental defects is not only larger than any other, but larger than all others combined.

"In view of the lack of attention to the dental needs of the children of the land, it is not surprising that of 925,873 men who were found unfit for military

duty by the first selective draft examinations, by reason of physical causes, the second highest of all causes of physical rejections was that of dental defects."

Dental Survey of School Children in Georgia - 1937-38 reveals the following conditions:

Of 171,463 white children examined in 128 counties, 69.8% had cavities. In considering cavities in deciduous teeth, it was found that of the number who had cavities there were 2.3 cavities per child; and considering permanent teeth, the number of children of elementary school age with cavities averaged 2 cavities per child, while high school children averaged 3.3 per child. Considering permanent and deciduous teeth, there were found to be 4 cavities per child for 119,725 children who had cavities.

Progress in Georgia

The Georgia Department of Public Health expresses appreciation to the dentists of Georgia for their assistance in attacking the problem of dental health. The 1937-38 report shows that 1018 schools in 128 counties had a dental inspection. Four years ago only 26 counties were participating in the State Dental Program. Of 171,463 children inspected in 1937-38 it was learned that 33.3% had been to a dentist within the last year. The report also indicates that 46 counties showed an appreciable reduction in percentage of children with decayed teeth. Sixteen of these counties reduced the incidence of decay 10% or more. In McDuffie County where an effective program has been in operation for several years, the number of children with cavities was reduced to 23% in 1937-38. This is about as low percentage of children with decayed teeth as it is possible to attain.

Refresher Courses in Children's Dentistry

Refresher Courses in Children's Dentistry are planned for the purpose of assisting the practicing dentist in the management of children and the technique of children's dentistry.

In May, 1938, the Georgia Department of Public Health, with the aid of Social Security funds conducted a five-day Refresher Course in Georgia. The meetings were held in five conveniently located centers of the State, with Dr. Walter McBride of Detroit, Michigan, as clinician. There was an attendance of more than 220. Because of the success of the Refresher Course last year, and through popular request, the Georgia Department of Public Health is again offering to the dentists of the State a Refresher Course in Children's Dentistry. Dr. McBride is returning to Georgia to conduct the courses. Dr. McBride has been an outstanding specialist in dentistry for children for the past fifteen years. He has a practical, usable message for dentists.

GEORGIA'S DENTAL HEALTH EDUCATION PROGRAM

For education we must depend upon the school; for dental health we must look to the dental and health professions. The program of the Division of Dental Health Education seeks to combine the forces of education and dental health. No matter how efficient the dental profession may become, it must depend upon the school to educate the public as to the value of mouth health and the factors involved in building and preserving sound teeth. Present mouth health conditions of children and adults would indicate that common practice lags far behind scientific knowledge of the dental profession concerning the care of the teeth. One of the surest and most effective ways to bridge the gap between common practice and scientific knowledge is through the health education program in the school and community.

Through the cooperation of the Georgia Dental Association, the State Department of Education, the Georgia Congress of Parents and Teachers, and the Agricultural Extension Service, the State Department of Public Health promotes the Dental Health Education program as outlined.

The Purpose of the Program

To promote dental health and dental health education as a contribution to the maintenance and improvement of general health.

To organize in every school and community a dental health education program, including inspections by the local dentists, correction of defects, and education of children and parents as to the value of mouth health and the preventive measures: early dental care, toothbuilding and protective foods, and mouth cleanliness.

Dental Inspections:

Local dentists give free dental inspection to pre-school and school children and 4-H Club members when properly approached by the county health officials and school superintendent. All Record Forms for dental inspections are furnished by the State Department of Public Health.

Correction of Defects

No plan of health service is complete without dental service. Correction of defects is an important part of this program. Each locality promotes the type of corrective program best suited to its problems and facilities. Dental Certificates furnished by the State Department of Public Health should be given to the children by the dentist when he has completed all necessary dental work.

Education:

Education of the parent and child as to the value of dental health is important. This training is carried on by the local health department, school, parent-teacher association, and 4-H Clubs. Authentic information on dental health can be obtained from local dentists and the State Department of Public Health and interpreted to the child in terms of child learning.

DENTAL HEALTH KNOWLEDGE FOR PARENTS AND TEACHERS

1. Good Dental Practice for a Child Consists of the following:
 - a. An early visit to the dentist (at pre-school age, since many two-year-olds have cavities).
 - b. Periodic visits to the dentist thereafter. (Twice a year may be often enough for the average, but in mouths where there is a tendency to decay, the visits should be more often.)
 - c. All cavities filled when small. NO CAVITY IS TOO SMALL TO FILL. (Bite-wing radiographs will help to find them early.)
 - d. All infected (abscessed) teeth removed from the mouth unless they can be successfully treated and filled.
 - e. Adequate and complete care of the first teeth, including the permanent teeth as they erupt. (The six-year molar does not replace any of the first teeth, but is added on in the back. It should be carefully watched and filled when necessary.)

2. Children Should Eat an Adequate Diet to Aid Tooth-Building.

Daily diet should include those foods which help to build strong teeth and surrounding structures. Coarse foods should be eaten for exercise of the teeth and gums.

A Suggested Adequate Diet

Milk - 8 ounce glass of milk at mealtime.

1 egg a day (minimum of 4 a week).

1 serving of meat, fish, chicken, liver, or cheese daily.

2 vegetables a day, one green or yellow, one raw.

1 serving of citrus fruit, tomato juice, raw cabbage or carrot daily.

1 fruit in addition to the above.

Cod liver oil - 1 teaspoon daily (especially important for the first two years; advisable in winter months for ages 2 to 5).

Butter - 1 tablespoon daily.

Bread - whole or cracked grain.

Cereal - (Avoid highly refined cereals because vitamins and minerals are decreased and starch content increased.)

It is advisable to avoid excessive amounts of sugars and starches as candy, syrups, pies, and pastries.

3. Toothbrushing, Properly Done: .

- a. Will keep the teeth cleaner.
- b. Will keep the mouth cleaner (as a receiving station for the foods we eat, it should be clean).
- c. Will tend to prevent certain forms of decay of the teeth.
- d. May prevent pyorrhea in later life.

4. Mouth habits, such as finger and thumb sucking, lip biting, etc., may cause irregular teeth. Irregular tooth arrangement may be corrected by the orthodontist.

5. Drugs should be used only on the advice of a qualified person.

- a. Proprietary products are often useless, expensive and injurious.
- b. Any dentifrice that is used should have the American Dental Association's "Accepted" seal.
- c. A mixture of salt and soda (3 to 1) makes an excellent dentifrice.
- d. Stain removers may destroy the enamel.
- e. Patent pain relievers may be fatally injurious.

6. Since fear of the dentist prevents much of the needed repair of the teeth, EDUCATE THE CHILD TO LOOK UPON THE DENTIST AS A FRIENDLY HEALTH COUNSELOR.

WHY FILL CHILDREN'S TEETH?

1. To maintain function of the teeth and jaws of these young patients during the early growing period of their lives. To have adequate function, the teeth must be in good condition with correct restorations where cavities have appeared. Proper fillings will prevent the loss of teeth and preserve the integrity of the arch, thereby maintaining the greatest efficiency of the teeth for mastication. Children should learn to chew and thoroughly masticate their food, and they must have good teeth with which to do it.
2. To prevent disease in the mouth, through which all food must pass, and to prevent systemic infection which is so often the sequelae of abscessed deciduous teeth. A cavity in a deciduous tooth will soon lead to a disturbance in the pulp, followed by a gumboil, which is an abscessed tooth. A correct filling before the cavity has become large is an excellent means of prevention.
3. To prevent pain. To prevent suffering, days lost from school or healthy play and recreation. To prevent upset nervous systems which are often caused by severe and prolonged toothache.
4. To prevent some types of malocclusion which follow when cavities lead to abscess formation and cause the premature loss of these teeth.
5. To prevent the loss of the first permanent molars. Statistics from Georgia surveys show that the first permanent molars are lost more frequently than are any of the other teeth. These teeth are the strongest and most useful from the standpoint of proper mastication. They are called the "Keystones" of the dental arch because of their importance. Early and proper attention to the defects in the occlusal surface (pits and fissures) will save the vast majority of these teeth.
6. To start early preventive periodic visits to the dentist, and establish proper habits of dental health.

Many other reasons might be given. Write your own.

DENTAL CERTIFICATE

The Georgia Department of Public Health furnishes Dental Certificates free to dentists. These certificates indicate to the school that all necessary dental work has been completed. Attention is called to the following message on the back of the Dental Certificate:

"The STATE DEPARTMENT OF PUBLIC HEALTH is interested in the general welfare of the child. A dental certificate should be issued only when all necessary dental treatment has been completed and the child is dismissed.

A dental certificate should mean that:

The mouth should be as clean as possible.

All cavities should be adequately treated.

All abscessed deciduous teeth should be extracted.

Final judgment concerning any mouth condition rests with the family dentist."

CALCIFICATION, ERUPTION, EXFOLIATION(R. Kronfeld, The Bur, Mar., 1935)Deciduous Dentition

Tooth	*First Calcific	Crown Completed	Eruption	Root Completed	Resorpt. Begins	Shedding
Cent.	5 mo.	4 mo.	6-8 mo.	1 $\frac{1}{2}$ -2 yr.	5-6 yr.	6-7 yr.
Lat.	5 mo.	5 mo.	8-10 mo.	1 $\frac{1}{2}$ -2 yr.	5-6 yr.	7-8 yr.
Cusp.	6 mo.	9 mo.	16-20 mo.	2 $\frac{1}{2}$ -3 yr.	6-7 yr.	10-12 yr.
1st M.	5 mo.	6 mo.	12-16 mo.	2-2 $\frac{1}{2}$ yr.	4-5 yr.	9-11 yr.
2nd M.	6 mo.	10-12 mo.	20-30 mo.	3 yr.	4-5 yr.	10-12 yr.

*Intrauterine

Permanent Dentition

Tooth	First Evidence Calcification	Crown Completed	Eruption	Root Completed
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Maxillary

Central	3-4 mo.	4-5 yr.	7-8 yr.	10 yr.
Lateral	1 yr.	4-5 yr.	8-9 yr.	11 yr.
Cuspid	4-5 mo.	6-7 yr.	11-12 yr.	13-15 yr.
1st Bicuspид	1 $\frac{1}{2}$ -1 3/4 yr.	5-6 yr.	10-11 yr.	12-13 yr.
2nd Bicuspид	2-2 $\frac{1}{4}$ yr.	6-7 yr.	10-12 yr.	12-14 yr.
1st Molar	Birth	2 $\frac{1}{2}$ -3 yr.	6-7 yr.	9-10 yr.
2nd Molar	2 $\frac{1}{2}$ -3 yr.	7-8 yr.	12-14 yr.	14-16 yr.
3rd Molar	7-9 yr.	12-16 yr.	17-30 yr.	18-25 yr.

Mandibular

Central	3-4 mo.	4-5 yr.	6-7 yr.	9 yr.
Lateral	3-4 mo.	4-5 yr.	7-8 yr.	10 yr.
Cuspid	4-5 mo.	6-7 yr.	10-11 yr.	12-14 yr.
1st Bicuspид	1 3/4-2 yr.	5-6 yr.	10-12 yr.	12-13 yr.
2nd Bicuspид	2 $\frac{1}{4}$ -2 $\frac{1}{2}$ yr.	6-7 yr.	11-12 yr.	13-14 yr.
1st Molar	Birth	2 $\frac{1}{2}$ -3 yr.	6-7 yr.	9-10 yr.
2nd Molar	2 $\frac{1}{2}$ -3 yr.	7-8 yr.	12-13 yr.	14-15 yr.
3rd Molar	8-10 yr.	12-16 yr.	17-30 yr.	18-25 yr.

THE FIRST APPOINTMENT

1. Introductory

The child, zoologically, is a small edition of the adult patient and, as such, he deserves adult consideration. We must appreciate the fact that a child's first visit to the dentist is important to his future behavior and well-being, and accordingly we must see that it is pleasant and, insofar as possible, painless. Let us see further that it is educational, so that we not only render a health service, but also prepare him for economical operating at the succeeding appointments.

2. Chart

Develop or secure a chart which is comprehensive enough to secure the information that is needed for a good record of services to be, and that have been rendered and for recording previous health information. Keep progress and developmental records as well as financial records.

3. Paradontia For The Child

A. Oral Hygiene Examination: Has he retained food, stain, or calculus?
How often does he brush his teeth?

B. Technique for Prophylaxis at the Chair

1. Prophylaxis for children is simple procedure. Seldom are accretions found prior to age of twelve or fourteen.
2. Polishing: Establish a rule of continuity. Always start on same tooth and proceed in same manner.

Use a good-tasting paste and polish one quarter of the mouth at a time. Try the following:

Flour of Pumice	170.00 gm.
Borax	30.00 gm.
Carminc (coloring)	.25 gm.
Glycerine	75.00 cc.
Oil of Spearmint	1.00 drop

A routine procedure for prophylaxis might be outlined as follows:

Cleanse all smooth surfaces of crowns with paste in rubber cups.

- (1) This removes all soft gingival accumulations.
- (2) Exposes accretions, if any, and uncovers decalcified areas.
- (3) Removes stains.

3. Disclosing Solution: Check the entire mouth with a disclosing solution. The following will be found satisfactory:

Mercurochrome 5% solution	1.5 gm.
Water	to make 30.0 cc.

If stain persists, use sandpaper disks, sulci disks, and smooth stones before final polishing. ALL STAIN REMOVERS ARE INJURIOUS TO THE ENAMEL.

4. Smooth Surfaces of Fillings: Use plug finishing burs for pits and fissures; and for the larger occlusal surfaces, one may use a large round bur, run backwards, or a tapered carborundum stone. The proximal margins should be smoothed with sandpaper disks, followed with Burlew Disks.
5. For Occlusal Surfaces: Use crescent brushes in contra angle. The midget size is desirable and more practical due to the fact that the shanks are shorter.

C. Vincent's Infection appears in children about as regularly as in adults but is seldom as severe. Frequently it is more of a severe gingivitis and seldom advanced ulcerative stages are seen.

Treatment is not different from that used for adults. Young patients should be seen daily during the acute stages, and they respond very readily to treatment.

Local application of any good spirocheticide with proper home care is usually sufficient.

5% Salvarsan in glucose (obtained in ampules) is an effective drug; should be worked in around the gingivae and other infected areas. A good method of application is with the use of a rubber polishing cup held in a porte polisher.

The home treatment advised is as follows:

1. Mouthwash of sodium perborate - level teaspoonful to large glass of water. (Should not be used over a prolonged period of time.)
2. Discard old toothbrush.
3. Liberal ingestion of milk and orange juice.
4. Segregation of utensils.
5. Abstinence from kissing.
6. Saline cathartic.
7. Rest.

After Vincent's Infection has cleared up, a thorough prophylaxis should be given and all cavities filled. All abscessed teeth and remaining roots (if present) should be removed at this stage and never during the acute infection.

REQUISITES OF FILLING MATERIALS AND TECHNIQUE FOR
MANAGING SMALL CHILD'S CARIOUS TEETH SHOULD BE

1. Practical. Simplify operative technique so as to shorten operating time.
2. Rational. Select filling materials on the basis of physical properties rather than on wonderful claims on package label and irrational claims of manufacturers.
3. Adequate. We must insert fillings that will last until the tooth is exfoliated if we are to justify our teachings as to the necessity of children's seeing their dentist at pre-school age.

Filling Materials

1. Gutta Percha. Temporary Stopping is readily penetrated by moisture. Base-plate gutta percha is more satisfactory as a temporary filling. It expands on heating and contracts on cooling.
2. Cements. The use of cements alone as a filling material on the basis of physical properties cannot be justified.
 - a. Zinc Cements. Crushing resistance is low. It shrinks on setting. It is soluble in saliva.
 - b. Black Copper Cement. Has a low crushing resistance, is quite soluble, and is a gum irritant. Germicidal value questionable.
 - c. Red Copper Cement. The same.
 - d. Silicate Cements. Show a negligible solubility. The average hardness is about 1/12 to 1/4 that of softest surface enamel.
3. Gold Foil. Because of the possibility of pulpal death, gold foil should be used with discretion in young permanent teeth.
4. Gold Inlay. Excessive cutting, cost, faulty hygiene of many children, possibility of recurrent decay common to newly erupted teeth, all contraindicate the use of the gold inlay in the young child patient. When the child reaches the teen age, the inlay should be considered seriously.
5. Tin Foil. Has a low temperature conductivity. It is probably inadequate as far as Brinnell test and specific gravity is concerned.
6. Copper Amalgam. Chief virtue is its comparatively little change in form after setting, and its adaptability and adherence to margins of the cavity. See comparison with silver amalgam on the following page.

Copper Amalgam is indicated where there is poorly formed enamel or denuded areas. It is useful in hypoplastic molars where cavity preparation is difficult and recurrent caries is highly probable.
7. Silver Amalgam. This is without doubt the most satisfactory filling material, all things considered, for use in deciduous and young permanent posterior teeth. It has greater strength than any other filling material except the gold inlay, and because of its rapid setting it is especially adapted for use with children.

Comparison of Amalgams:

<u>Silver Amalgam</u>	<u>Copper Amalgam</u>
Retains occlusion	It will cup out
Can be carved	Impossible to maintain contact
Maintains contact	Edges are brittle
Can be condensed	Cannot be condensed
Gives desirable expansion	Has decided shrinkage during
Not soluble	setting period
Will not stain tooth	It may kill the pulp
	It is soluble
	Will stain tooth
	Is a tissue irritant

The thermal conductivity is about the same.

TWO OF THE BEST CONTROLS FOR ELIMINATION OF DECIDUOUS PULP DEATHS UNDER AMALGAM OR ANY FILLING MATERIAL ARE:

1. The ability of the operator to differentiate between a normal vital tooth and one with questionable prognosis.
2. The use of a cavity lining or base under all fillings of appreciable depth.

SUGGESTED FILLING MATERIALS AND INDICATIONS FOR SAME

(In Order Of Preference)

- A. Deciduous Anterior Teeth
 - 1. Proximal and Labial Restorations
 - a. Silicate
 - b. Silver Amalgam
- B. Deciduous Posterior Teeth
 - 1. Occlusal Restorations
 - a. Silver Amalgam
 - b. Inlay
 - c. Copper Amalgam (in selected cases)
 - 2. Proximo-occlusal Restorations
 - a. Silver Amalgam
 - b. Inlay
 - c. Over-lay
- C. Permanent Anterior Teeth
 - 1. Proximal Restorations
 - a. Silicate
 - b. Gold Inlay
 - c. Gold Foil
 - d. Porcelain Inlay
 - 2. Proximo-incisal Restorations
 - a. Gold Inlay
 - b. Porcelain Inlay
 - c. Gold Inlay with Porcelain Window
 - 3. Labial Restorations
 - a. Silicate
 - b. Porcelain Inlay
 - c. Gold Foil
 - 4. Lingual Restorations
 - a. Gold Foil
 - b. Silver Amalgam
 - c. Silicate
- D. Permanent Posterior Teeth
 - 1. Occlusal Restorations
 - a. Silver Amalgam
 - b. Gold Foil
 - c. Gold Inlay
 - d. Copper Amalgam (in selected cases)
 - 2. Proximo-occlusal Restorations
 - a. Silver Amalgam
 - b. Gold Inlay
 - c. Over-lay
 - 3. Buccal Pit Restorations
 - a. Silver Amalgam
 - b. Gold Foil
 - c. Copper Amalgam (in selected cases)
 - 4. Lingual Pit Restorations
 - a. Silver Amalgam
 - b. Gold Foil

FRACTURED AND LOST ANTERIORS

With so much emphasis being placed on physical education and competitive games in our school curriculum and the many social activities of our boys and girls, accidents resulting in fractured and lost teeth are becoming more frequent.

Among the common varieties of fractures are the following:

1. Diagonal
 - a. Incisal Angles, involving the mesio-incisal angles of the central incisors.
 - b. Angles and Third, involving the mesio-incisal angle of one tooth and the mesio-incisal Third of another, with pulpal involvement of the latter.
2. Lateral
 - a. Usually involves half of the crown and the pulp chamber.
 - b. Occasionally the tooth is severed at gingiva.
 - c. Sometimes just the incisal portion.
 - d. Multiple Lateral - involving a portion of two or more teeth.
 - e. Central Lobe, just the central lobe of incisal.
 - f. Incisal Third, generally a lateral fracture of this third of the two central incisors, and consequently the pulps of each.
3. Longitudinal
 - a. Terminating in pulp chamber.
 - b. Often well below the gingiva.

TREATMENT AND RESTORATION OF FRACTURED ANTERIORS

1. Immediate Treatment
 - a. Make radiogram to determine
 - (1) the proximity of fracture (no pulp involvement) to horn of pulp.
 - (2) the apical development.
 - (3) possibility of alveolar or root fracture.
 - b. If fracture is slight as in l.a., 2.c., or 2.e., diskling of roughened surface will suffice.
 - c. If pulpal area shows pink through dentine or if pulp is slightly exposed:
 - (1) make radiogram.
 - (2) isolate tooth and wipe with oil of cloves.
 - (3) place a celluloid crown filled with a paste of zinc-oxide and oil of cloves and leave for ten days to two weeks.
 - d. If exposure is larger or pulp protruding:
 - (1) make radiogram.
 - (2) if patient is seen immediately do a pulpotomy, using novocain.
 - (3) if after 24 hours, do a pulpectomy.
2. Temporary Restoration (Ten days or two weeks later)
 - a. Gold Crown.
 - b. Orthodontic Band with silicate.
 - c. Clasp-onlay with silicate window (sometimes called a slipper overlay).

3. Permanent Restoration (at sixteen to eighteen years)
 - a. Porcelain Jacket Crown.
 - b. Three-quarter Crown with porcelain windows.

RESTORATION OF LOST PERMANENT TEETH

1. If adjacent teeth are fully erupted, the so-called orthodontic bridge, constructed by banding two adjacent teeth with orthodontic band material and on an .030 wire connecting the two, solder a pontic backing. This will suffice until teeth will support a permanent bridge.
2. Dentures with clasps supplying the teeth.
3. A space maintainer if family finances will not permit one of the above.

Space Maintenance

The early or premature loss of deciduous teeth, particularly the deciduous molars, is a very frequent cause of malocclusion. Many such cases can be prevented by the judicious use of a space maintainer.

All spaces caused by the premature loss of deciduous teeth do not show a tendency to drift. Close observation of these cases will determine the need or lack of need of a space maintainer, which should be placed if drifting of the adjacent teeth or closure of the space is observed.

The band and loop maintainer will serve in the majority of cases.

Where orthodontic materials are not available, the following technique may be found useful:

- a. Secure an impression of the abutment tooth (usually a posterior) in the same fashion as for making a cast overlay.
- b. The impression is poured in inlay investment material.
- c. When thoroughly hard, separate and trim down the gingivae, giving the tooth an elongated appearance. This allows the band to fit underneath the gingivae giving more retention.
- d. Using thin, 28 or 30 gauge Kerr wax, adapt a band to the tooth. Do not allow wax to rest on occlusal so that when completed it will strike the opposing tooth in occlusion.
- e. Make a circular loop of 18 gauge sprue wax with a diameter equal to the space to be maintained, and adapt this to the tissue with a saddle effect.
- f. Lute this to the wax band. Add the necessary sprues.
- g. Invest and cast, using hard gold.

For other types of space maintainers, the operator is referred to the journals or any of the text books on Juvenile Dentistry.

CAVITY PREPARATION

With the exception that less depth can be procured in deciduous teeth, Black's prescribed cavity preparation will, generally speaking, answer all requirements in the cavity preparation of deciduous teeth.

Pain-reducing factors:

- a. Use a slow motor and a large bur when removing caries.
- b. Speed of engine should be uniform.
- c. Use sharp burs and instruments.
- d. The indiscriminate use of air to dry cavity is painful. Use cotton pellets instead.
- e. Less pain is caused if decay is removed with large round burs. The size of the bur is determined by the size of the cavity.

Summary of Instruments, Burs, etc., Used in Cavity Preparation of Deciduous Teeth

(Adapted from Juvenile Dentistry, Dr. Walter C. McBride)

Incipient Class I Cavities:

- Fissure opening - #34 bur.
- Fissure extension - #557 bur.
- Caries removal - #2 bur.

Open Class I Cavities:

- Caries removal - #8 bur; #3 or #4 for periphery.
- Wall extension - #558 bur.
- Fissure extension - #34 bur; #557 bur.
- Smooth margins - Tapering carborundum stone

Incipient Proximal Cavities:

- Cavity opening - #701 bur or #73 Chayes Stone; #558 bur.
- Caries Removal - Selected round burs; smaller round burs for periphery.
- Step preparation - #34 bur; #558 bur; #559 bur.
- Proximal wall and floor - #559 bur.
- Smooth margins - Tapering carborundum stone.

(Exception is taken to this procedure when the adjacent tooth is the first permanent molar or if the marginal ridge of the second deciduous molar is intact and not undermined; then the cavities in the mesial surfaces of those teeth may be prepared as pit cavities. In these cases the "step" preparation is done first.)

Open Proximal Cavities:

- Caries removal - Break down walls with chisels; #8 round bur; #3 bur for periphery.
- Step preparation - #34 bur; #558 bur; #559 bur.
- Proximal wall and floor - #559 bur.
- Smooth margins - Tapering carborundum stone.

Mesial Pit Cavities:

- Pit opening - #34 bur.
- Pit extension - #557 bur.
- Caries removal - #2 bur.

Class III Cavities:

Incipient Class III Cavities

- Access - #700 bur.
- Caries removal - #2 bur.
- Extension - #557 bur.

Open Class III Cavities

- Caries removal - Selected round bur
- Extension - #557 bur.
- Retention - # $\frac{1}{2}$ bur or #33 $\frac{1}{2}$ bur.

Class IV Cavities: Disk away the proximal contact to depth of carious tissue.

Because of the exfoliation age of the deciduous cuspids, this should not be done, but the cavities should be prepared for filling.

Class V Cavities: May be treated as Class I Cavities.

OUTLINE OF FILLING PROCEDURE

KEEP THE CHAIN INTACT!



1. Cavity Preparation
2. Sterilization
3. Dry Area
4. Insertion of lining or base
5. Use of matrix
6. Packing and condensing of alloy
7. Carving
8. Disking of opposing cusp
9. Polishing

1. Follow outline of cavity preparation.
2. Notwithstanding the fact that it cannot be confined and does discolor, silver nitrate (ammoniacal), reduced by oil of cloves, is perhaps the best sterilizing agent for posterior teeth. Phenol or oil of cloves may be used for anterior teeth. Ammoniacal silver nitrate may be obtained in ampules or prepared as follows:

Preparation of ammoniacal silver nitrate

"Put three grams of silver nitrate crystals in test tube and add one cubic centimeter of water. Heat over flame to dissolve, being careful not to let it boil. Let it cool until you can hold it in the palm of your hand. Now add 28% ammonia water slowly. At first a black precipitate will be formed. Keep adding the ammonia and shaking the mixture until the black is almost dissolved. DO NOT LET IT ALL DISSOLVE or you will have too much ammonia, which is undesirable. Filter through filtering paper. Keep solution in brown well-stoppered bottle."

From Forsyth Interne's Manual.

After application of this solution to tooth, let stand for 1 to 2 minutes and reduce with oil of cloves for same length of time.

3. Dry area with warm air before inserting cement lining or base.
4. Any of the cements will make a satisfactory lining.
5. Use a matrix for two reasons:
 - a. To give a fourth wall so filling may be properly condensed.
 - b. To prevent bulk of material overhanging at cervical margin.
6. Filling must be thoroughly packed and condensed. Small pluggers are suggested for condensing and packing alloy.
7. Excess amalgam clinging to matrix should be removed before the band is removed. Margins should be trimmed with suitable carvers. The occlusal surface of fillings in deciduous teeth should not be carved as deeply as

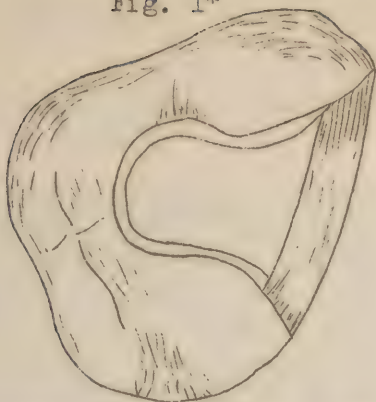
those in permanent teeth, because of the possibility of weakening them at the "step", which is already a weak point. The marginal ridge should be so defined that food will not be impacted at contact point. Wipe all margins with cotton pellet. It saves time in final finish.

8. Many good fillings are lost because of the pointed cusps of some opposing deciduous teeth. This is particularly true of lingual cusp of upper first deciduous molar. In occlusion this cusp seats deeply in proximal areas and where the cavity has been of long standing it seats deeper, due to concurrent exfoliation. Have the patient close his teeth and observe the occlusion prior to inserting filling. If the bite appears close, take the opposing cusp out of occlusion by disking with a stone.
9. All restorations should be polished. Use disks for mesial and distal surfaces. Plug finishing burs or tapered carborundum stones for occlusal surfaces. Burlaw Disks and pumice followed with tin oxide complete the polish.

Reasons for do-over work

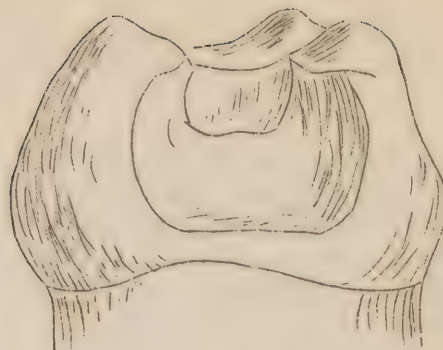
1. Fillings left too high.
2. Occlusal carved too deeply.
3. Failure to disk opposing cusp out of occlusion.
4. Failure to use matrix and properly condense filling.

Fig. 1*



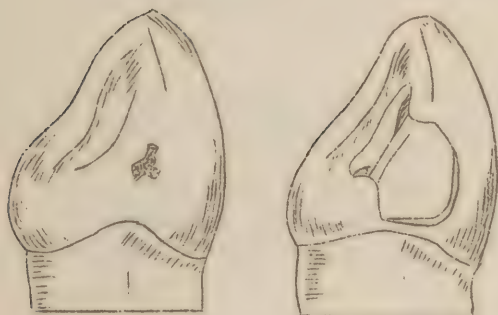
Occlusal View of Class Two
Cavity Preparation Showing
Wide Neck.

Fig. 2



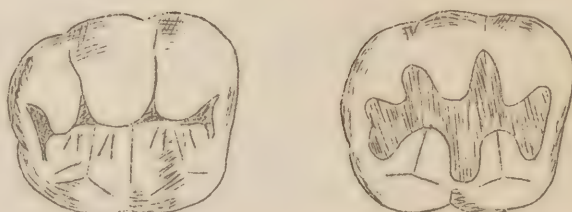
Proximal View of Class Two
Cavity Preparation.

Fig. 3



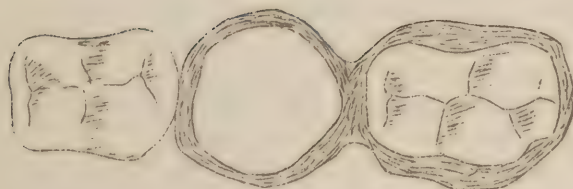
The distal preparation for
the cuspid.

Fig. 4



The prophylactic fissure filling.

Fig. 5



Occlusal View of Band and Loop
Space Maintainer. Use .030 wire
for loop or may be cast.

Fig. 6



Orthodontic Bridge. This
Appliance Restores Lost Perma-
nent Incisor for Child. Made
by Means of Orthodontia Bands
and Facing and Backing Soldered
to the Bands.

*Drawings on this page are arranged from those in the Nebraska and Minnesota bulletins.

PULP MANAGEMENT FOR DECIDUOUS AND YOUNG PERMANENT TEETH

"The best pulp management in all children's dentistry is preventive operative dentistry, begun early and continued regularly." Dr. K. A. Easlick.

Deep Deciduous Cavities - Routinely seal a sedative treatment in all teeth presenting with a history of an ache and in all deep seated cavities, even though the tooth has not been troublesome. A paste made by incorporating zinc-oxide powder in one or two drops of oil of cloves, to which paste is added a little powdered silver nitrate just before insertion, is very effective. Upon the patient's return, the remaining caries is removed, silver nitrate reduced by oil of cloves, cement base placed, and filling inserted.

Exposed Vital Deciduous Pulp - When exposures occur from instrumentation or caries, one has a choice of:

1. Pulp Capping.
2. Pulpotomy (partial pulp removal).
3. Pulpectomy (complete pulp removal).
4. Extraction.

1. Pulp capping may be successful in selected cases. However, it is not advocated after the pulp has begun its resorptive period.
2. Pulpotomy is the partial removal of the pulp. In preference to using pressure or novocain anaesthesia, Easlick has revamped the formula of one of the former desensitizing pastes and his technique follows. (See Page 21.)
3. Pulpectomy is the complete removal of pulp and is indicated where the pulpal tissue is vital yet in all probability has had a bacterial invasion. This may be done by the use of:
 - a. Pressure anaesthesia.
 - b. Conduction anaesthesia.
 - c. Desensitizing paste.
 - d. Devitalizing paste.

After desensitization or devitalization, in an isolated field the pulp chamber is completely opened and the pulpal tissue removed from the canals with a fine barbed broach. The operator must bear in mind that the canal terminates about one to two mm. from the apex of the root. After extirpation of pulp, seal in a sedative such as oil of cloves for a few days prior to filling. The Kerr Sealer powder and glycerine-iodine solution as used in pulpomies or any paste amenable to tissue and which becomes sufficiently hard upon setting will be effective as a root canal filling.
4. Extraction of teeth with exposures should be the last resort. Spaces should be maintained for harmonious growth. Retain the teeth unless they cannot be successfully treated and filled.

Acute Abscesses and Putrescent Deciduous Teeth - If an acute abscess will drain promptly upon opening, it can be treated in a few days as in any other putrescent tooth condition which has subsided after its initial acute stage. For those teeth with acute abscesses which do not drain promptly after they are opened, extraction is indicated.

Putrescent teeth may be classified into two types on basis of their response to treatment:

1. Those that drain through cavity in crown of tooth and respond to drug therapy.

First Appointment: Radiograph. Open pulp chamber, remove debris, and seal in drug. Those most frequently used are beechwood creosote, azochloramide, merthiolate, and Lugols Iodine Solution.

Second Appointment: Remove root canal contents and repeat drug treatment. (Putrescent teeth should be treated until we have at least one negative culture.)

Third Appointment: Place root canal filling and restoration.

2. Those in which drainage has been established through a fistula - group which may be treated with difficulty.

These cases seldom respond to drug treatment, particularly if the radiogram shows a large area of bone destruction at the bifurcation between the roots. Extraction is generally indicated.

Young Permanent Teeth

Young permanent teeth present three problems in pulp management:

1. Near exposures

- a. Remove all leathery dentine until comparatively firm dentine appears.
- b. Reduce ammoniacal silver nitrate with oil of cloves.
- c. Place a thin plastic mix of zinc cement and then a heavier mix to complete the base.
- d. Place restoration.

2. Vital exposures

- a. Remove leathery dentine and seal in oil of cloves or some similar sedative under cement.
- b. At next appointment anesthetize the tooth by conduction and peridental infiltration.
- c. Isolate field with rubber dam, sterilize tooth and instruments to be used.
- d. Amputate occlusal portion of pulp to the entrance of each canal.
- e. Cauterize each canal stump with hot instrument.
- f. Flood the chamber with hydrogen peroxide, followed with saline solution and then dried.
- g. Use the same paste and technique as outlined for deciduous tooth pulpotomy. (See Page 21.)

3. Putrescent Teeth

The anterior teeth can always be managed by a root canal filling and root resection. However, once a young permanent tooth becomes infected, the procedure of choice is extraction.

PARTIAL PULPECTOMY TECHNIQUE FOR MANAGING VITAL EXPOSURES IN DECIDUOUS TEETH

(Dr. K. A. Easlick)

1. First Appointment

- a. On finding a vital exposure, wipe out the cavity with some sedative - eugenol, oil of cloves, or chloretone-eugenol.
- b. Place a little paste on the tip of a plastic instrument and wipe off over the exposure.
- c. Seal with a plastic mix of zinc cement for one week to two weeks. (If the cavity is wiped out with a sedative and the formaldehyde paste not forced into the pulp chamber with a stiff mix of cement, there will be no pain caused by the paste. A half aspirin tablet has quieted any toothache we have caused in a small child.)

2. Second Appointment (10 days to 2 weeks later)

- a. Isolate the tooth well with cotton rolls; sterilize the cemented tooth with tincture of iodine; dip all spoons and burs in an antiseptic; for example, phenol or metaphen.
- b. Cut the occlusal wide open over the pulp chamber with a cross cut fissure bur and amputate the pulp, level with the floor of the pulp chamber with a suitable size round bur. It is not necessary to go into the root canals. (If the paste has devitalized properly, the pulp tissue will show no sensation when pricked and will not bleed when amputated. If not completely devitalized, seal paraform paste for another week.)
- c. Clean and dry pulp chamber.
- d. Make a "whipped-cream" mix of one capsule of Kerr Sealer powder and one drop of glycerine-iodine and smear in pulp chamber with a plastic instrument.

Glycerine-Iodine

Iodine Crystals	8-12 grains
Glycerine	1 ounce

Heat on hot water bath until crystals go into solution.

- e. Cut a piece of base-plate gutta percha about the size of the pulp chamber; pick it up on a hot amalgam plugger; soften slightly in a flame; use this as a plunger to push the paste tight against the pulp chamber floor over the ends of the pulp tissue in the canals. Burnish the gutta percha to place with a hot ball burnisher.
- f. Cement base and amalgam filling at once.

Paraform Paste "H"

Paraformaldehyde	1.00 gram
Procaine Base	0.30 gram
Powdered Asbestos	0.50 gram
Vaseline	1.25 gram
Carmines to color	

HOME CARE OF THE TEETH

1. Instruct patients in technique of brushing.

See American Dental Association Brushing Charts. (May be secured from Bureau of Public Relations, American Dental Association.)

Smaller editions may be obtained for distribution to parents. They are useful to hang on the back of the door in the medicine cabinet for daily instruction.

2. Teach parents to brush the teeth of the child.

The parent should brush the child's teeth carefully once a day until the child is old enough to follow the technique properly. Parents should not expect the small child to properly brush the teeth any more than a small boy would be expected to wash his ears clean.

3. Teach brushing the teeth for cleanliness as a daily habit.

4. "DEBUNK" the toothpaste racket.

Suggest a dentifrice which carries the "Seal of Approval of the American Dental Association."

WHAT KIND OF TOOTHBRUSH FOR THE CHILD?

For the Baby

A tiny brush with a single row of bristles may be used. The bristles should be soft so as not to injure the tissues. Cotton or gauze with or without impregnation of boric acid should suffice to keep the teeth clean.

For the three-year-old and up to twelve

A child-size brush. The brush head should be about one inch long, the tufts of bristles should be set apart and the bristles should be of medium stiffness.

After twelve years

A regular adult brush may be used.

The daily use of antiseptic mouthwashes is not necessary.

Medicated mouthwashes should be prescribed by the dentist for specific treatment of specific conditions.

Where the parents desire to use a mouth wash, suggest a mild solution of salt water (table salt).

HINTS ON CHILD MANAGEMENT

1. Treat the child with understanding.
2. Try to conquer by persuasion.
3. Be kind but firm, and smile.
4. Go about the operation in a methodical manner and an attitude of assurance. A child will soon sense indecision. Be master of the situation at all times.
5. Never lie to a child. If you think the operation will be painful, tell the child so and assure him that with his cooperation you will do the necessary work as easily as possible. In this way you will gain the confidence of the child much quicker and more completely.
6. Call the child by his or her first name. Don't use pet names.
7. Treat the child with simple and respectful dignity. Do not use "baby talk" or attempt to be patronizing.
8. Make the first visit as pleasant as possible. Greet the child with a smile and approach him slowly. Do not attempt to rush him into the operating room. Give him a chance to look you over and gain an impression of your kindness and sincerity.
9. When a child is brought in with toothache at first visit, do nothing but relieve the toothache and make him as comfortable as possible; other work should wait until subsequent visits when he will be more receptive to your ability to be of service in preventing a recurrence of the toothache.
10. Answer questions intelligently and fully. Short answers tend to destroy confidence. The asking of questions indicates an interest and your answers can easily lead to discussions of health and the value of the service you are rendering.
11. As a rule, better work can be done and the child more easily handled if the parent does not come into the operating room. The parent should not answer questions you expect the child to answer. The parent should not attempt to help you control the child. This is your work.
12. Finish what you start; otherwise, future work will be difficult.
13. Show an interest in the child's activities and hobbies. The child lives in a world which is just as important to him as your world is to you.
14. Do not keep the child for long appointments. He tires easily. Do not keep him waiting in the reception room too long. Meet appointments as promptly as possible.
15. Show genuine admiration when the child acts bravely. Do not belittle honest fear in the child. Dentistry may be a new and totally different experience; and all people, big or little, are afraid of new experiences.
16. Give honest service and do not leave the impression with the parent that because the patient is a child the work is not important or may be done for half price. They will think you are doing only half price work and will treat dental health for the child accordingly.

DENTAL HEALTH PROMOTION IN YOUR COMMUNITY

1. Promotion of the annual dental inspections of every school child by
 - (a) inspections in schools by dentists.
 - (b) examination of classrooms of children of individual children in the dental office.

No dental inspections should be made, however, without the card system which notifies the parents of the condition of the child's teeth (the number of cavities should not be mentioned, however) and a system in the schoolroom which urges dental care and records which indicate when it is completed.

2. Promotion of demonstrations on dental health with such groups as the 4-H Clubs; parent-teacher associations; civic clubs; and other groups which are generally interested in the betterment of the community.
3. Organization and use of a Speakers' Bureau of dentists who will agree to talk to various lay groups in their own or other counties and cities.
4. The purchase and use of slides and movies for lecture work. May be obtained from the Public Relations Bureau of the American Dental Association.
5. The purchase and use of exhibit material, models, charts, etc., for county fairs, health weeks, and every suitable occasion. May also be obtained from the American Dental Association at very reasonable cost, or from the State Department of Public Health.
6. The purchase and use of the new American Dental Association newspaper dental health stories released in September 1938 for use in local newspaper.
7. Participation in and promotion of all health work in the county, not in dentistry alone.
8. Support public health nursing programs and promote the appreciation of the necessity of having public health nurses in every county and in every school system.
9. Work with parent-teacher groups to stimulate dental care of the pre-school groups in your community. This is one of the most effective phases of dental health education.
10. Promote Children's Dentistry - the doing of it by the dentists in your county and the importance of it among your laity. Join the American Society for the Promotion of Dentistry for Children and keep actively abreast with the latest trends in this field.
11. Promote the use of visual education devices for daily use in the dental office and the occasional use for lay meetings.
12. Cooperate with local physicians in advice for pre-natal dental care.
13. Encourage the selection of protective foods by all people as a safety measure for general and dental health.
14. NEVER SIGN A SCHOOL CHILD'S CARE "DENTAL WORK ALL COMPLETED" UNLESS THE WORK HAS ACTUALLY BEEN COMPLETED. It is unfair to the child and destroys faith in the profession as well as faith in the importance of DENTAL HEALTH.

